

What is claimed is:

1           1.     A multi-session disc comprising:  
2                     a compact disc read only memory (CD-ROM) session in which a lead-in area, a  
3 lead-out area and a user area, each having a CD-ROM format, are distinguished; and  
4                     a digital versatile disc (DVD) application formatted according to a  
5 predetermined file system recorded in the user area.

1           2.     The disc of claim 1, wherein the predetermined file system is a universal disc  
2 format (UDF).

1           3.     The disc of claim 1, wherein the predetermined file system is a universal disc  
2 format (UDF) bridge format.

1           4.     An apparatus to record/reproduce data on/from a multi-session CD including a  
2 CD-ROM session in which a lead-in area, a lead-out area and a user area, each having a CD-  
3 ROM format, are distinguished, comprising:  
4                     a first encoder to encode received audio and/or video (A/V) signals into a DVD format  
5 to provide an A/V stream;  
6                     a first formatter to format the A/V stream according to a predetermined file system for  
7 a DVD application; and  
8                     a second formatter to write data formatted according to the predetermined file system to  
9 the user area, to format data for the lead-in area and the lead-out area in the CD-ROM format,  
10 and to write the CD-ROM formatted data to the lead-in area and the lead-out area.

1           5.     The apparatus of claim 4, further comprising:  
2                     a second encoder to encode the received audio and/or video (A/V) signals in accordance  
3 with a CD application format to provide the A/V stream;

4 a third formatter to format the A/V stream received from the second encoder in the CD  
5 application format; and

6 a fourth formatter to write the output of the second formatter in the CD-ROM session  
7 format and to write the output of the third formatter in the CD session format, to provide  
8 multi-session CD formatted data.

1 6. The apparatus of claim 4, wherein the predetermined file system is a universal  
2 disc format (UDF).

1 7. The apparatus of claim 4, wherein the predetermined file system is a universal  
2 disc format (UDF) bridge format.

1 8. The apparatus of claim 4, further comprising:  
2 a differentiator to determine whether a disc loaded into the apparatus is a video CD, an  
3 audio CD, or the multi-session CD having the CD-ROM session;  
4 an analyzer to analyze whether the predetermined file system exists on the multi-session  
5 CD if the differentiator determines that the disc is the multi-session CD having the CD-ROM  
6 session;  
7 a first deformatter to deformat the DVD application when the predetermined file system  
8 exists, to provide first deformatted data; and  
9 a first decoder to decode the first deformatted data to restore the A/V signals.

1 9. The apparatus of claim 8, further comprising:  
2 a second deformatter to deformat a CD application which has been read from the disc if  
3 the differentiator determines that the disc is either the video CD or the audio CD or that the disc  
4 is the multi-session CD and the CD-ROM session is an audio CD session or a video CD session,  
5 to provide second deformatted data; and  
6 a second decoder to decode the second deformatted data to restore the A/V signals.

10. The apparatus of claim 4, further comprising:

a first differentiator to determine whether a disc loaded into the apparatus is a DVD or a CD by checking a physical structure of the disc;

a second differentiator to determine whether the disc is a video CD, an audio CD or the multi-session CD having the CD-ROM session if the first differentiator determines that the disc is the multi-session CD;

an analyzer to analyze whether the predetermined file system exists if the second differentiator determines that the disc is the multi-session CD having the CD-ROM session, or if the first differentiator determines that the disc is the DVD;

a first deformatter to deformat the DVD application stored on the disc if the predetermined file system exists, to provide first deformatted data;

a first decoder to decode the first deformatted data to restore the A/V signals;

a second deformatter to deformat a CD application which has been read from the loaded disc if the second differentiator determines that the disc is either the video CD or the audio CD, or that the disc is the multi-session CD and that the CD-ROM session is an audio CD session or a video CD session, to provide second deformatted data; and

a second decoder to decode the second deformatted data to restore the A/V signals.

11. A method of recording/reproducing data on/from a multi-session CD having a CD-ROM session in which a lead-in area, a lead-out area and a user area, each having a CD-ROM format, are distinguished, comprising:

(a) encoding received audio and/or video signals into a DVD format to provide an A/V stream;

(b) formatting the A/V stream according to a predetermined file system for a DVD application; and

(c) writing the A/V stream formatted according to the predetermined file system to the user area, formatting data for the lead-in area and the lead-out area in the CD-ROM format, and writing

10 the CD-ROM formatted data to the lead-in area and the lead-out area, to provide first formatted  
11 data.

1 12. The method of claim 11, further comprising:

2 (d) encoding the received audio and/or video signals in accordance with the CD application  
3 to provide the A/V stream;

4 (e) formatting the A/V stream according to the CD application format to provide second  
5 formatted data; and

6 (f) writing the first formatted data according to the CD-ROM session format and writing  
7 the second formatted data according to the CD session format, to provide multi-session CD  
8 formatted data.

1 13. The method of claim 11, wherein the predetermined file system is a universal disc  
2 format (UDF).

1 14. The method of claim 11, wherein the predetermined file system is a universal disc  
2 format (UDF) bridge format.

1 15. The method of claim 11, further comprising:

2 (d) determining whether a disc loaded into a drive is a video CD, an audio CD or the multi-  
3 session CD having the CD-ROM session;

4 (e) determining whether the predetermined file system exists if said step (d) determines that  
5 the disc is the multi-session CD having the CD-ROM session;

6 (f) deformatting the DVD application on the user area of the disc when the predetermined  
7 file system exists and providing first deformatted data; and

8 (g) decoding the first deformatted data to restore the A/V signals.

1 16. The method of claim 15, further comprising:

2 (h) deformatting a CD application which has been read from the disc if said step (d)  
3 determines that the disc is the video CD or the audio CD, or that the disc is the multi-session CD  
4 and that the CD-ROM session is an audio CD session or a video CD session, to provide second  
5 deformatted data; and

6 (i) decoding the second deformatted data to restore the A/V signals.

1 17. The method of claim 11, further comprising:

2 (d) determining whether a disc loaded into a drive is an audio CD by analyzing control  
3 information in a sub-Q area of the lead-in area of the disc, and if the loaded disc is the audio CD,  
4 playing the audio CD, and otherwise, determining whether the disc is a video CD by analyzing  
5 top of contents (TOC) information;

6 (e) analyzing the video CD information on a first track of the disc and playing the video  
7 CD according to the analyzed video CD information if said step (d) determines that the disc is the  
8 video CD and, if said step (d) determines that the disc is not the video CD, analyzing the TOC  
9 information to determine whether the disc is the multi-session CD including the CD-ROM session;  
10 and

11 (f) analyzing the predetermined file system and reproducing the DVD data if said step (e)  
12 determines that the disc is the multi-session CD having the CD-ROM session.

1 18. The method of claim 11, further comprising:

2 (d) determining whether a disc is a DVD or a CD by checking a physical structure of the  
3 disc;

4 (e) determining whether the disc is an audio CD, a video CD or the multi-session CD  
5 having the CD-ROM session, if said step (d) determines that the physical structure of the disc  
6 corresponds to that of a CD;

7 (f) determining whether the predetermined file system exists if said step (d) determines that  
8 the physical structure of the disc corresponds to that of a DVD or if it is determined in said step  
9 (e) that the disc is the multi-session CD having the CD-ROM session;

(g) deformatting the DVD application read from the disc when the predetermined file system exists, to provide first deformatted data; and

(h) decoding the first deformatted data to restore the A/V signals.

19. The method of claim 18, further comprising:

(i) deformatting a CD application which has been read from the disc if said step (e) determines that the CD is the video CD or the audio CD, or that the CD is the multi-session CD and that the CD-ROM session is an audio CD session or a video CD session, to provide second deformatted data; and

(j) decoding the second deformatted data to restore the A/V signals.

20. The method of claim 11, further comprising:

(d) determining whether a disc is a DVD or a CD by analyzing a physical structure of the disc;

(e) determining whether the disc is an audio CD by analyzing control information in a sub-Q area of the lead-in area of the disc if said step (d) determines that the physical structure of the disc corresponds to that of a CD, and playing the audio CD if the disc is the audio CD, and, otherwise, determining whether the disc is a video CD by analyzing TOC information;

(f) analyzing video CD information on a first track of the disc and playing the video CD according to the analyzed video CD information if said step (e) determines that the disc is the video CD, and, if said step (e) determines that the disc is not the video CD, determining whether the CD is the multi-session CD having the CD-ROM session; and

(g) analyzing the predetermined file system and reproducing DVD data if said step (e) determines that the disc has the physical structure of a DVD or if said step (f) determines that the CD is the multi-session CD having the CD-ROM session.

21. A multi-session disc comprising:

2 a session in which a lead-in and/or lead-out area and a user area, each having a  
3 format according to a first format type, are distinguished; and  
4 information having a second format type according to a predetermined file system  
5 is recorded in the user area.

1 22. The disc according to claim 21, wherein the first format type is a CD-ROM format  
2 and the second format type is a DVD format.

1 23. A method of recording on a multi-session disc divided into a lead-in area, a lead-out  
2 area and a user area, each having a CD-ROM format, comprising:  
3 formatting an audio/video signal stream in a DVD format according to a predetermined file  
4 system for a DVD application; and  
5 writing the formatted audio/video signal stream to the user area.

1 24. An apparatus to record on a multi-session disc divided into a lead-in area, a lead-out  
2 area and a user area, each having a CD-ROM format, comprising:  
3 a first formatter to format an audio/video signal stream in a DVD format according to a  
4 predetermined file system for a DVD application; and  
5 a second formatter to write the formatted audio/video signal stream to the user area.

1 25. An apparatus to reproduce data from a multi-session CD including a CD-ROM  
2 session in which a lead-in area, a lead-out area and a user area, each having a CD-ROM format,  
3 are distinguished, comprising:  
4 a differentiator to determine whether a disc loaded into the apparatus is a video CD, an  
5 audio CD, or the multi-session CD having the CD-ROM session;  
6 an analyzer to analyze whether a predetermined file system exists if the differentiator  
7 determines that the disc is the multi-session CD having the CD-ROM session;

8 a first deformatter to deformat a DVD application when the predetermined file system  
9 exists, to provide first deformatted data; and  
10 a first decoder to decode the first deformatted data to restore original A/V signals from the  
11 disc.

1 26. The apparatus of claim 25, further comprising:  
2 a second deformatter to deformat a CD application which has been read from the disc if  
3 it is determined by the differentiator that the disc is either a video CD or an audio CD or that the  
4 disc is the multi-session CD and that the CD-ROM session is an audio CD session or a video CD  
5 session, to provide second deformatted data; and  
6 a second decoder to decode the second deformatted data to restore the original A/V signals.

1 27. A method of reproducing data from a multi-session CD including a CD-ROM  
2 session in which a lead-in area, a lead-out area and a user area, each having a CD-ROM format,  
3 are distinguished, comprising:

4 (a) determining whether the disc is a DVD or a CD by checking a physical structure of the  
5 disc;

6 (b) determining whether the disc is a video CD, an audio CD or the multi-session CD  
7 having the CD-ROM session step (a) determines that the disc is the CD;

8 (c) analyzing whether a predetermined file system exists if said step (b) determined that the  
9 disc is the multi-session CD having the CD-ROM session, or if said step (a) determines that the  
10 disc is the DVD;

11 (d) deformatting a DVD application stored on the disc if the predetermined file system  
12 exists, to provide first deformatted data;

13 (e) decoding the first deformatted data to restore original A/V signals from the disc;

14 (f) deformatting a CD application which has been read from the disc if said step (b)  
15 determines that the disc is either the video CD or the audio CD, or that the disc is the multi-



session CD, and that the CD-ROM session is an audio CD session or a video CD session, to provide second deformatted data; and

(g) decoding the second deformatted data to restore the original A/V signals.

28. An apparatus to record data on a physical layer of a multi-session optical disc which is divided into a lead-in area, a lead-out area and a user area, each having a first format type, comprising:

a first encoder to encode received audio and/or video signals into a second format type to provide an A/V stream;

a first formatter to format the A/V stream according to a predetermined file system for a application of the second format type; and

a second formatter to write data formatted according to the predetermined file system to the user area, to format data for the lead-in area and the lead-out area according to the first format type, to write the data formatted according to the first format type to the lead-in area and the lead-out area.

29. A multi-session CD comprising:

an audio session; and

a CD-ROM session, including a DVD application.